

Claims

1. A method for the identification of an enzyme with a desired substrate-cleaving activity, wherein a library encoding a plurality of different polypeptide candidates is expressed by suitable host organisms in such a manner that the polypeptide candidates are presented on the surface of the host organisms and the host organisms are contacted with the substrate to be cleaved, characterised in that
 - (a) on the surface of the host organisms a helper enzyme is provided which allows the formation of a covalent bond between the surface of the host organisms and a product created by the substrate cleaving reaction which is catalysed by a polypeptide candidate and
 - (b) the identification of the host organisms which have the product bound to their surface.
 2. The method according to claim 1, wherein the enzyme has hydrolase activity.
 3. The method according to claim 2, wherein the enzyme is esterase.
 4. The method according to claim 3, wherein the esterase is the esterase EstA from *Pseudomonas aeruginosa*.
 5. The method according to any one of claims 1 to 4, wherein the helper enzyme is a peroxidase.
 6. The method according to claim 5, wherein the peroxidase is a horseradish peroxidase.
 7. The method according to any one of claims 1 to 6, wherein the substrate is an ester.
 8. The method according to claim 7, wherein the ester is a phenyl ester.
 9. The method according to any one of claims 1 to 8, wherein the substrate is linked to one of the markers which allow the detection of the product which is covalently bound to the cell surface.
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10. The method according claim 9, wherein the marker is a fluorescence marker, a chemiluminescence marker, a radioactive marker, biotin, avidin, magnetic particles or an enzyme which leads to a detectable dye upon contact with a chromogenic substance.
 11. The method according to any one of claims 1 to 10, wherein the host organism is a phage.
 12. The method according to any one of claims 1 to 10, wherein the host organism is a cell.
 13. The method according to claim 12, wherein the host organism is a procaryotic organism.
 14. The method according to claim 13, wherein the procaryotic organism is a gram-negative bacterium.
 15. The method according to claim 14, wherein the gram-negative bacterium is of the species *E. coli*.
 16. A host organism which expresses a polypeptide candidate (enzyme) in such a manner that it is presented on the surface of the host organism and which at the same time carries a helper enzyme on its surface which is able to catalyse a reaction which allows the formation of a covalent bond between the surface of the host organism and a product of a substrate cleaving reaction which is catalysed by the polypeptide candidate.
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